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Courier Press, Leamington Spa, England.

## Description

This invention relates to beverage packages.

In U.K. Patent Specification 2121762A we described a system for obtaining beverages from, inter alia, sealed sachets containing a product providing a beverage when mixed with water, for example ground coffee or leaf tea. The sachet contains a filter material to retain the coffee grounds or tea leaves and preferably is provided with a plastics nozzle at the top to assist in locating the sachet correctly with a water-introduction injector. The base of the sachet is opened, for example by cutting or by the provision of a pressure- or heat-sensitive seal, an aqueous medium is introduced through the nozzle, and the beverage is collected from the opening in the sachet base.

One problem with such sachets arises from irregular base openings. When the base of a generally rectangular sachet is opened, the opening (produced for example by cutting off the lowest sachet seam) is roughly elliptical. The ellipse tends to pucker as the hot liquid leaves the sachet. This can cause an unpredictable direction of outflow for the liquid; the liquid does not necessarily stream vertically downwards. This is very undesirable and can lead to spillage of the beverage.

A further problem with such sachets is the means selected for providing the base opening. Cutting a fold forming the base seam is an obvious method, but this necessitates the provision of shears in the beverage machine. This increases cost and complicates maintenance. Self-opening seals — where the base seam is formed of, e.g. a pressure-sensitive adhesive — are an alternative, but these are not always entirely satisfactory. With a pressure-sensitive seal, which relies for its opening on the pressure of the aqueous medium being introduced into the sachet, as soon as a small opening appears in the base the air pressure in the sachet rapidly falls. It thus proves difficult to complete the opening in a reliable and reproducible manner.

Another difficulty with such sachets is the use thereof to provide beverages where it is desirable to dispense the whole contents of the sachet into the beverage-receiving receptacle (e.g. cup). Typical examples of such products are water-dispersible or water-soluble soups, powdered chocolate, or syrups. With such products a fine filter material within the sachet will impede or prevent full dispensing. To omit a filter altogether also has its problems since the moment the sachet base is opened, the contents are released without mixing fully with the aqueous medium introduced into the sachet. This can lead to a poorly dispersed beverage possibly containing lumpy solids.

We have now devised improved sachets which enable these problems to be solved. This is achieved by including a web of material within the sachet (which web may or may not

be a filter mesh) which is provided with an upwardly-facing seam which tends to evert when aqueous medium is introduced at the top of the sachet.

According to the invention there is provided a generally planar sealed beverage sachet formed of a substantially air- and water-impermeable sheet material, said sheet material enclosing and being attached to a web of material which supports a product which provides a beverage when mixed with an aqueous medium, said web material having a seam whose apex points upwardly towards said product, the sheet material having a base seam generally parallel to and below said web seam whereby to seal said web seam within the sachet, the arrangement being such that, when in use with aqueous medium being introduced into the sachet from the top thereof, said web seam tends to evert downwardly and the beverage is released from the sachet through an opening made therein at or adjacent to said base seam.

With infusion-type beverages where the product in the sachet (e.g. ground coffee or leaf tea) is to be retained therein after infusion, the web material will preferably be a laminar sheet of filter material of a sufficient mesh size to retain the infused solids.

With dispersion- or dissolution-type beverages, where the whole contents of the sachet are to be dispensed, the web material will preferably be a non-permeable laminar sheet or a relatively coarse mesh material. If it is a non-permeable sheet then some means should be provided to enable the sachet contents to be released. This means may be, for example, a frangible seal which opens upon introduction of the aqueous medium into the sachet. We have found that with dispersion-type drinks such as soups or powdered chocolate, the use of a relatively coarse mesh material is particularly advantageous. Upon introduction of the aqueous medium and eversion of the coarse mesh, a large proportion of the dispersible material is retained on the mesh for mixing with the aqueous medium, so as to leave the pack as a liquid dispersion rather than as undispersed particles. Even upon storage prior to use, the majority of the dispersible material remains on the correct side of the coarse mesh because the mesh itself is pressed in contact against the surfaces of the substantially air- and water-impermeable sheet material and little particulate material escapes into the volume below the web material.

It is preferred, but not essential, that the base seam be formed of a heat- or pressure-sensitive seal which is broken when a fluid medium such as air or water is forced into the sachet. Alternatively the base seam may be just a fold line in the air- and water-impermeable sheet material and which requires cutting prior to use of the sachet.

It is also preferred that the sachet includes a

locating means for an aqueous medium-introducing means. This locating means is preferably a nozzle sealed in the top seam of the sachet.

The sachet may be generally rectangular, although in one embodiment the side seams taper inwardly in a downward direction.

Preferred sachets according to the invention are illustrated in the accompanying drawings, given by way of example, in which:-

Figure 1 is a front elevation of a sachet,

Figure 2 is a section along the line A-A of Figure 1, with the sachet sealed,

Figure 3 is a similar section to Figure 2 but with the sachet opened,

Figures 4, 5 and 6 are cross-sections of further sachets according to the invention, and

Figure 7 is a perspective view showing the web material for use in a further embodiment of the invention.

Referring to Figures 1 to 3 the sachet shown is generally constructed in the manner as previously shown in Figure 2 of U.K. Patent Specification 2121762A. It consists of two sheets of a water- and air-impermeable sheet material 2 welded together at seams 4. The bottom seam 6 is formed with a pressure-sensitive adhesive applied between the long dashed lines shown in Figure 1. Within the sachet is an inverted V-shaped sheet of web material 8 which is a laminar sheet of filter material and which is adhered to the sheet material 2 on each side over an area 10 which is best described as rectangular, but with the top side of the rectangle being curved inwardly and downwardly rather than straight. The filter material 8 is provided with a centre fold 12 whose apex points upwardly so that sheet material 2 and filter material 8, when bonded together, form, in the section shown in Figure 2, a W-shape. The filter material 8 supports a beverage-providing product 14 and the top seam of the sachet incorporates a flanged nozzle 16 whose delivery channel 18 is obturated by a layer of a sheet barrier material 20.

The sheet material 2 is a multilayer laminate such as (from the outside to the inside) polyester, aluminium foil, polyester, polypropylene. The filter material 8 is a laminate of melt blown polypropylene sandwiched between layers of non-woven spun-bonded polypropylene. The pressure-sensitive adhesive is a pressure-sensitive lacquer which is sold by E. I. du Pont de Nemours under the trade mark "Surllyn".

In use as shown in Figure 3, hot water is introduced into the sachet through a hollow injector 22 which pierces barrier material 20 and enters delivery channel 18. The water pressure causes the filter material to evert about fold 12 to provide a generally flat plane or downwardly convex filter bed. The eversion effect assists in the rupture of the pressure-sensitive seal of seam 6. Because of the geometrical shape of area 10, the bottom opening to the sachet is generally elliptical and is formed in a reproduceable manner from sachet to sachet.

Referring to Figure 4, and using the same

reference numerals to Figures 1 to 3, the illustrated sachet is identical to that shown in Figures 1 to 3 with the addition of the fact that the filter material 8 is provided with two further folds 30 such that the material is in the form of a W, the upper arms of which are adhered to the water- and air-impermeable material 2. The self-opening seal at the base of the sachet is shown at 6 and the evertable region of the filter material is indicated by the dotted lines.

Figure 5 shows a further embodiment, this time a sachet shown for dispensing chicken noodle soup. The web of sheet material 8 is a coarse mesh filter, the mesh openings being of sufficient size to allow the ingredients 14 thereabove to pass through when the sachet is opened. In this example the soup noodles are separated from the rest of the ingredients 14 and are stored in the sachet at 8, below the coarse web 8. When the sachet is opened, as described above, the web everts and the noodles fall out of the sachet. Hot water enters the sachet through the nozzle and because the web tends initially to retain much of the ingredients 14 there is considerable dispersion thereof in the sachet and as they fall through the web. This arrangement improves dispersion and tends to avoid the formation of undispersed solid lumps in the final beverage. Typically the web 8 is polyethylene or polypropylene non-woven mesh, such as the product Net 909 commercially available from Smith & Nephew Plastics Limited, Gliberdyke, N. Humberstone, U.K. A mesh size defined by a mesh weight of about 22 g/m<sup>2</sup> has been found appropriate for the purpose.

In the Figure 6 embodiment, the web of sheet material 8 is formed as two separate non-permeable sheets 32 and 34 adhered together with a pressure-sensitive adhesive along a web seam 36 so as to form an upwardly directed inverted V-shape. The downwardly-directed arms of the inverted V are permanently adhered to sheet material 2 at 38 and 40. In use the inverted V first tends to evert and the pressure-sensitive bottom seam 6 opens. As pressure builds up, the pressure-sensitive seam 36 then parts to discharge the sachet contents.

Finally, in Figure 7, a folded web of non-permeable sheet material 8 is shown for use in a sachet. This is a continuous sheet material with an opening 42 covered with a frangible seal 44 e.g. heat- or pressure-sensitive. When the sachet is opened and the web 8 everts, the frangible seal 44 ruptures to release the contents of the sachet. It is arranged that the material covering the opening 42 remains attached to the web 8 even after the seal 44 has ruptured.

#### Claims

1. A generally planar sealed beverage sachet formed of a substantially air- and water-impermeable sheet material (2), said sheet material enclosing and being attached to a web (8) of material which supports a product (14) which provides a beverage when mixed with an aqueous medium,

the sheet material (2) having a base seam (6) generally parallel to and below said web whereby to seal said web within the sachet, characterised by said web material having a seam (12; 36) whose apex points upwardly towards said product, the arrangement being such that, when in use with aqueous medium being introduced into the sachet from the top thereof, said web seam (12; 36) tends to evert downwardly and the beverage is released from the sachet through an opening made therein at or adjacent to said base seam.

2. A sachet according to claim 1 wherein the web material is permeable.

3. A sachet according to claim 2 wherein the product (14) is ground coffee or leaf tea and the web material forms a filter therefor.

4. A sachet according to claim 2 wherein the product forms a beverage when dispersed or dissolved in said aqueous medium and said web material is a coarse mesh which releases said product when aqueous medium is introduced into the sachet and the latter opened.

5. A sachet according to claim 1 wherein said web material is non-permeable (Figs. 6, 7) and means are provided for releasing said product from its support by said web material when the sachet is used.

6. A sachet according to claim 5 wherein said releasing means comprises a frangible seal (36, 44).

7. A sachet according to claim 6 wherein said web material comprises two non-permeable sheets (32, 34) attached to said air- and water-impermeable sheet material and said web seam comprises a frangible seal (36).

8. A sachet according to claim 6 or 7 when said frangible seal is pressure- or heat-sensitive.

9. A sachet according to any of claims 1 to 8, wherein said base seam (6) comprises a frangible seal.

10. A sachet according to claim 9 wherein said base seam is formed as a pressure- or heat-sensitive seal.

11. A sachet according to any of claims 1 to 8, wherein said base seam comprises a fold in the substantially air- and water-impermeable sheet material.

12. A sachet according to any of claims 1 to 11 wherein a locating means (16) for an aqueous medium introducing means is provided on the sachet.

13. A sachet according to claim 12 wherein the locating means comprises a plastics nozzle (16) attached to the sachet.

14. A sachet according to any of claims 1 to 13 wherein said web material, in cross-section, forms an inverted generally V-shape (Figs. 2, 5, 6, 7) or a W-shape (Fig. 4) with the downwardly-directed arms of the inverted V or the upwardly-directed arms of the W attached to the substantially air- and water-impermeable sheet material.

15. A sachet according to any of claims 1 to 14 wherein the side seams taper inwardly in a downward direction.

## Patentansprüche

1. Im allgemeinen eben verschlossener Getränkebeutel, welcher aus im wesentlichen luft- und wasserundurchlässigem Blattmaterial (2) gebildet ist, wobei besagtes Blattmaterial eine Materialeinlage (8) einschließt und mit ihr verbunden ist, welche ein Produkt (14) trägt, welches ein Getränk ergibt, wenn es mit einem wäßrigen Medium gemischt wird, wobei das Blattmaterial (2) einen Bodensaum (6) aufweist, welcher sich im allgemeinen parallel zu und unterhalb der genannten Einlage befindet, um dadurch die genannte Einlage im Innern des Beutels abzuschließen, dadurch gekennzeichnet, daß besagtes Einlagematerial einen Saum (12, 36) aufweist, dessen Spitze nach oben zum genannten Produkt hin gerichtet ist, wobei die Anordnung eine solche ist, daß bei Verwendung mit wäßrigem Medium, welches in den Beutel von dessen Oberseite eingeführt wird, besagter Bodensaum (12, 36) zum Auswärts-Drehen nach unten tendiert und daß das Getränk aus dem Beutel durch eine Öffnung, welche darin am oder anliegend an besagten Bodensaum hergestellt ist, freigegeben wird.

2. Beutel nach Anspruch 1, bei dem das Einlagematerial durchlässig ist.

3. Beutel nach Anspruch 2, bei dem das Produkt (14) gemahlener Kaffee oder Blatt-Tee ist und das Einlagematerial ein Filter dafür bildet.

4. Beutel nach Anspruch 2, bei dem das Produkt nach Dispersion oder Auflösung in besagtem wäßrigem Medium ein Getränk bildet und besagtes Einlagematerial ein grobes Maschenmaterial ist, welches besagtes Produkt freigibt, sobald wäßriges Medium in den Beutel eingeführt wird und den letzteren öffnet.

5. Beutel nach Anspruch 1, bei dem besagtes Einlagematerial nicht-durchlässig ist (Fig. 6, 7) und Mittel vorgesehen sind, um besagtes Produkt von seiner Halterung durch genanntes Einlagematerial freizugeben, sobald der Beutel verwendet wird.

6. Beutel nach Anspruch 5, bei dem die genannte Freigabeeinrichtung einen brechbaren Verschuß (36, 44) aufweist.

7. Beutel nach Anspruch 6, bei dem besagtes Einlagematerial zwei nicht-durchlässige Blätter (32, 34) aufweist, welche mit besagtem luft- und wasserundurchlässigen Blattmaterial verbunden sind, und besagter Bodensaum einen brechbaren Verschuß (36) aufweist.

8. Beutel nach Anspruch 6 oder 7, bei dem besagter brechbarer Verschuß druck- oder hitzeempfindlich ist.

9. Beutel nach einem der Ansprüche 1 bis 8, bei dem besagter Bodensaum (6) einen brechbaren Verschuß aufweist.

10. Beutel nach Anspruch 9, bei dem besagter Bodensaum als ein druck- oder hitzeempfindlicher Verschuß ausgebildet ist.

11. Beutel nach einem der Ansprüche 1 bis 8, bei dem besagter Bodensaum eine Falte in dem im wesentlichen luft- und wasserundurchlässigen Blattmaterial aufweist.

12. Beutel nach einem der Ansprüche 1 bis 11, bei dem auf dem Beutel eine Einrichtung zum Ausrichten (16) auf eine wäßriges Medium zuführende Vorrichtung vorgesehen ist.

13. Beutel nach Anspruch 12, bei dem die Ausrichteinrichtung eine mit dem Beutel verbundene Kunststoffdüse (16) aufweist.

14. Beutel nach einem der Ansprüche 1 bis 13, bei dem besagtes Einlagematerial im Querschnitt eine umgekehrte allgemeine V-Form (Fig. 2, 5, 6, 7) oder eine W-Form (Fig. 4) bildet mit den nach unten gerichteten Armen des umgekehrten V oder den nach oben gerichteten Armen des W verbunden mit dem im wesentlichen luft- und wasser-undurchlässigen Blattmaterial.

15. Beutel nach einem der Ansprüche 1 bis 14, bei dem die seitlichen Säume sich in abwärts gerichteter Richtung nach innen verjüngen.

#### Revendications

1. Sachet pour boissons scellé, généralement planaire, formé d'un matériau en forme de feuille (2) sensiblement imperméable à l'air et à l'eau, ledit matériau en forme de feuille enfermant et étant fixé à un tissu (8) de matériau qui supporte un produit (14) qui donne une boisson lorsqu'il est mélangé à un milieu aqueux, ledit matériau en forme de feuille (2) comprenant un joint de base (6) généralement parallèle et situé au dessous dudit tissu afin de sceller ainsi ledit tissu à l'intérieur du sachet, caractérisé en ce que ledit matériau en forme de tissu comporte un joint d'étanchéité (12, 36) dont le sommet est dirigé vers le haut en direction dudit produit, la disposition étant telle qu'en service, lors de l'introduction d'un milieu aqueux dans le sachet à partir du haut de celui-ci, ledit joint de tissu (12, 36) tend à se retourner vers le bas et la boisson est délivrée du sachet au travers d'une ouverture ménagée à l'intérieur ou à proximité dudit joint de base.

2. Sachet selon la revendication 1, dans lequel le matériau du tissu est perméable.

3. Sachet selon la revendication 2 dans lequel le produit (14) est du café moulu ou du thé en feuilles et le matériau du tissu forme un filtre à cet effet.

4. Sachet selon la revendication 2 dans lequel le produit forme une boisson lorsqu'il est dispersé ou dissous dans ledit milieu aqueux et ledit matériau de tissu est un tamis à grosses mailles

qui laisse passer ledit produit quand le milieu aqueux est introduit dans le sachet et quand ce dernier est ouvert.

5. Sachet selon la revendication 1 dans lequel ledit matériau de tissu est imperméable (Fig. 6, 7) et des moyens sont prévus pour libérer ledit produit de son support par le matériau de tissu quand le sachet est utilisé.

6. Sachet selon la revendication 5 dans lequel lesdits moyens de libération comprennent un joint frangible (36, 44).

7. Sachet selon la revendication 6 dans lequel ledit matériau en forme de tissu comprend deux feuilles non-perméables (32, 34) fixées audit matériau en forme de feuille imperméable à l'air et à l'eau et ledit joint de tissu comprend un joint frangible (36).

8. Sachet selon la revendication 6 ou 7 dans lequel ledit joint frangible est sensible à la pression ou à la chaleur.

9. Sachet selon l'une quelconque des revendications 1 à 8, dans lequel le joint de base (6) comprend un joint frangible.

10. Sachet selon la revendication 9 dans lequel ledit joint de base est réalisé sous forme d'un joint sensible à la pression ou à la chaleur.

11. Sachet selon l'une quelconque des revendications 1 à 8 dans lequel ledit joint de base comprend un pli dans le matériau en forme de feuille sensiblement imperméable à l'air et à l'eau.

12. Sachet selon l'une quelconque des revendications 1 à 11 dans lequel des moyens de positionnement (16) pour des moyens d'introduction d'un milieu aqueux sont prévus dans le sachet.

13. Sachet selon la revendication 12 dans lequel les moyens de positionnement comprennent une buse plastique (16) fixée au sachet.

14. Sachet selon l'une quelconque des revendications 1 à 13 dans lequel ledit matériau en forme de tamis constitue en coupe transversale une forme généralement en V (Fig. 2, 5, 6, 7) ou en W (Fig. 4) renversé avec les branches tournées vers le bas du V renversé ou les branches tournées vers le haut du W renversé fixées au matériau en forme de feuille sensiblement imperméable à l'air et à l'eau.

15. Sachet selon l'une quelconque des revendications 1 à 14 dans lequel les joints latéraux sont en oblique vers l'intérieur dans une direction descendante.

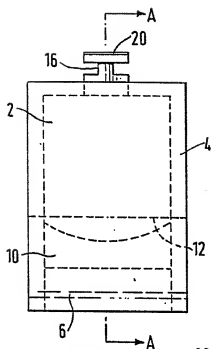


Fig.1.

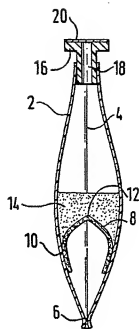


Fig.2.



Fig.3.

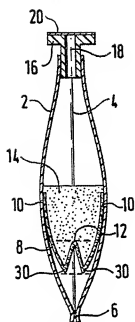


Fig. 4.

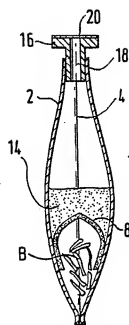


Fig. 5.

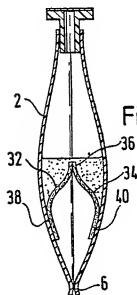


Fig. 6.

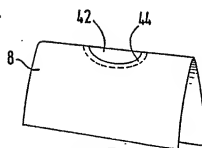


Fig. 7.